Vestnik zoologii, **41**(6): 555—559, 2007

UDK 595.34(262.54)

CYCLOPINOIDES LITTORALIS (CRUSTACEA, CYCLOPINIDAE) IN THE SEA OF AZOV AND FIRST DESCRIPTION OF ITS MALE

V. I. Monchenko

Schmalhausen Institute of Zoology, NAS of Ukraine,
Bogdan Chmielnicky str., 15, Kyiv, 01601 Ukraine

Accepted 10 October 2007

***Cyclopinoides littoralis* (Crustacea, Cyclopinidae) in the Sea of Azov and First Description of its Male. Monchenko V. I.** — *Cyclopinoides littoralis* (Brady) is recorded for the first time in Sea of Azov, in four sites of the southern part of the sea. Illustrated description is presented. The described male differs from the female in several secondary sexual characters: geniculated antennulae, an additional seta on free segment of V pair of swimming legs, etc. Discussed species is the representative of the Mediterranean-Lusitanic complex in the Azov and Black Sea basin fauna.

Key words: Copepoda, Cyclopinidae, *Cyclopinoides littoralis*, Sea of Azov, male.

Вид *Cyclopinoides littoralis* (Crustacea, Cyclopinidae) в Азовском море и первое описание его самца. Монченко В. И. — Циклопинида *Cyclopinoides littoralis* (Brady) впервые обнаружена в Азовском море в четырех местонахождениях южной его части. Представлено полное иллюстрированное переописание вида. Впервые обнаруженный и описанный самец отличается от самки рядом вторичных половых признаков (геникулирующие антеннулы, дополнительная щетинка на свободном членике плавательной ноги V пары и др.). В зоогеографическом отношении вид является представителем Средиземноморско-Лузитанского комплекса в фауне Азово-Черноморского бассейна.

Ключевые слова: Copepoda, Cyclopinidae, *Cyclopinoides littoralis*, Азовское море, самец.

Cyclopoida of the Sea of Azov were enough weakly studied before our investigations (Мордухай-Болтовской, 1960 а, б; Монченко, 1974, 2003). Because of this each new species record or addition to the fauna of Azov are important for knowledge of biology of this sea. The mentioned faunistic record is also contemporary in connection with increasing salinity of this Sea during last decades consequently the ponding of the main rivers — tributaries of the sea. In this situation discussed species is really marine component in fauna, invasive from the Black Sea.

In given case we propose not only record of *Cyclopinoides littoralis* on southern parts of the Sea of Azov, but add the description of the male of this species, which earlier was not known.

Cyclopinoides littoralis (Brady)

— *littoralis* Brady, 1872: 5 (*Cyclops*); Giesbrecht, 1901: 43 (*Cyclopina*); Kiefer, 1929: 15; Lang. 1946: 1; Lindberg, 1953: 322 (*Cyclopinoides*); Monchenko, 1977: 20.

Material. 1) Sea of Azov, Utluk gulf, thickets of *Zostera*, 25‰, 24.08.1980, 4 ♀, 8 ♂, 10 juv. (Monchenko); 2) Sea of Azov, Sivash at Genichesk, thickets of Zostera, 27.08.1980, 4 ♀, 2 ♂ (Monchenko); 3) Sea of Azov, Arabat gulf at village Semenovka, interstitial, 40 l, 08.09.1974, ♀ (Monchenko); 4) Sea of Azov, Arabat gulf near settlement Mysovoye, interstitial, 40 l, 09.11.1974, 2 ♀, 2 ♂ (Monchenko).

Redescription. Female. The total length 673—710 μm. Syncephalon wide, frontal part of syncephalon oval; abdomen narrow and slender (fig. 1, *1*). Posterior edges of somites smooth. First pedigerous somite is clearly separated from syncephalon. The fifth thoracal and genital double-somite of characteristic outlines (fig. 1, *2*). The genital double-somit 1.25 times as long as wide. Slender caudal rami slightly divergent, their length 4.0– 5.0 times is more than width. The relative length of all setae is visible from fig. 1, *3*).

Antennula 18-segmented exceeding 2/3 of syncephalon lengths (fig. 1, *4*), densely covered by downy setae, with long sensory appendage on distal segment. Antenna 4-segmented with outer seta of exopodite (fig. 1, *5*). Well developed palp of mandible with 1 seta on basipodite and with 3 setae on first segment of endopodite (fig. 1, *6*). Maxillula

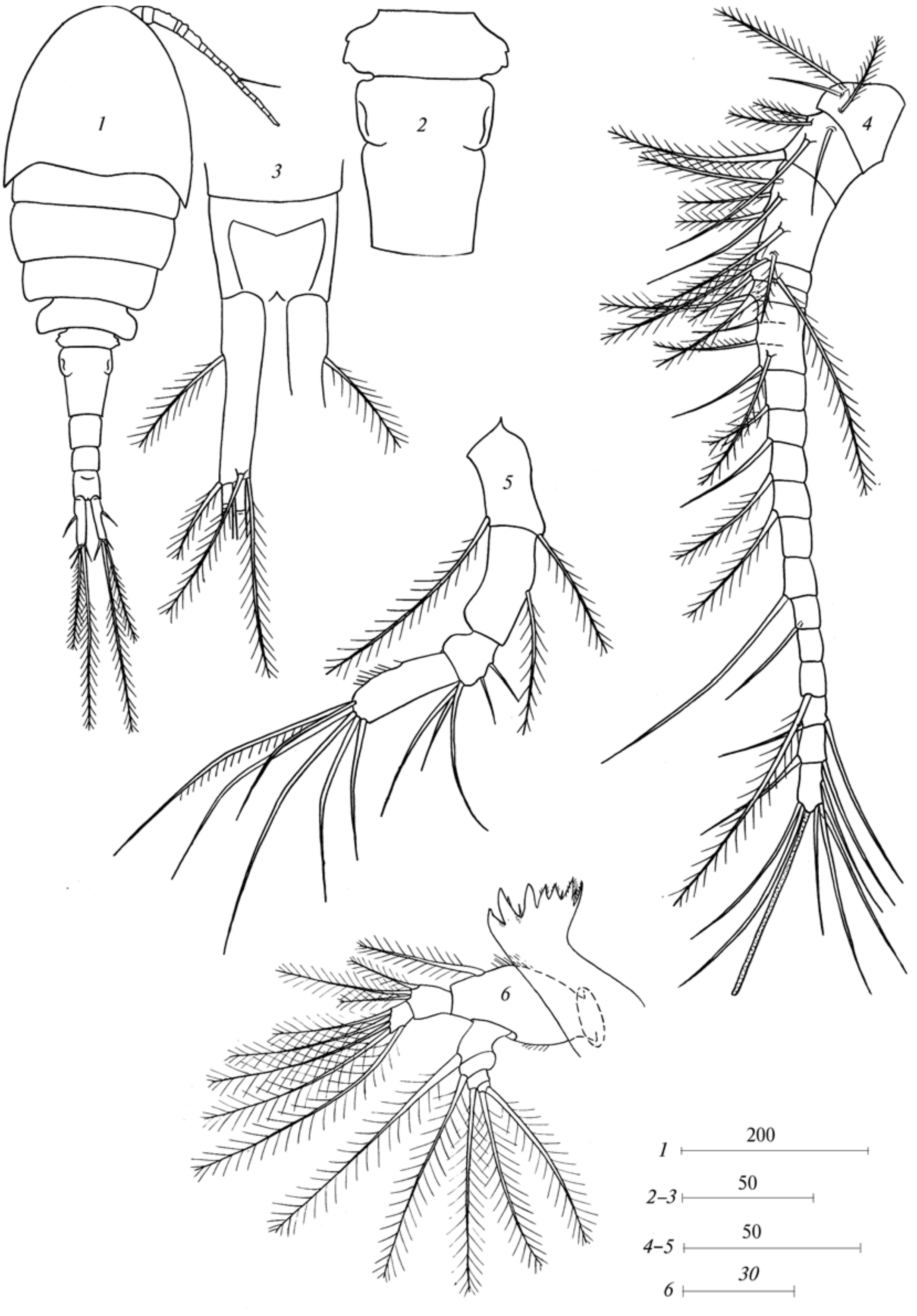


Fig. 1. *Cyclopinoides littoralis*, ♀: *1* — habitus, dorsal; *2* — genital double-somite; *3* — caudal rami, dorsal view; *4* — antennula; *5* — antenna; *6* — mandible with the palp. Scale bar in μkm.

Рис. 1. *Cyclopinoides littoralis*, ♀: *1* — общий вид, дорсально; *2* — генитальный сомит; *3* — каудальные ветви, дорсально; *4* — антеннула; *5* — антенна; *6* — мандибула со щупиком. Все масштабные линейки в микрометрах.

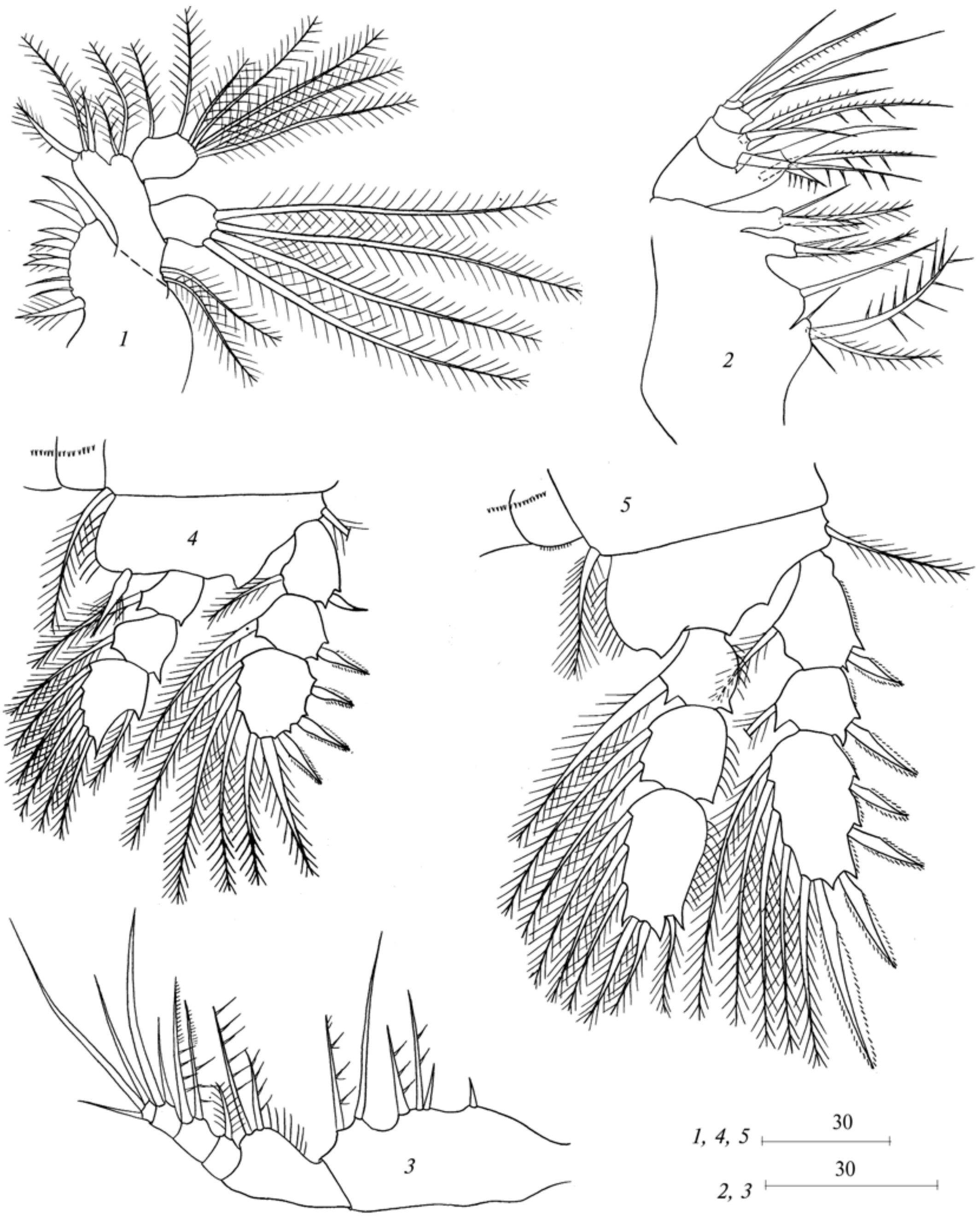


Fig. 2. *Cyclopinoides littoralis*, ♀: *1* — maxillula with the palp; *2* — maxilla; *3* — maxilliped; *4, 5* — swimming legs P1—P2.

Рис. 2. *Cyclopinoides littoralis*, ♀: *1* — максиллула со щупиком; *2* — максилла; *3* — максиллипеда; *4, 5* — плавательные ноги P1—P2.

is presented on fig. 2, *1*, its abundant armament is rather usual for Cyclopinidae. Maxilla with rich rigid armament (fig. 2, *2*). Maxilliped with 4-segmented endopodite, its segments armed as follows: 1, 2, 2, 3 (fig. 2, *3*). Swimming legs P1—P4 as on fig. 2, *4—5* and fig. 3, *1*. Segmentation 3/3, 3/3, 3/3, 3/3. Inner setae of coxopodites short, except for P1. Inner appendage of basipodite P1 spineformed, hardly reaches end of second segment of adjacent endopodite. Formula of spines on distal segments of exopodites of

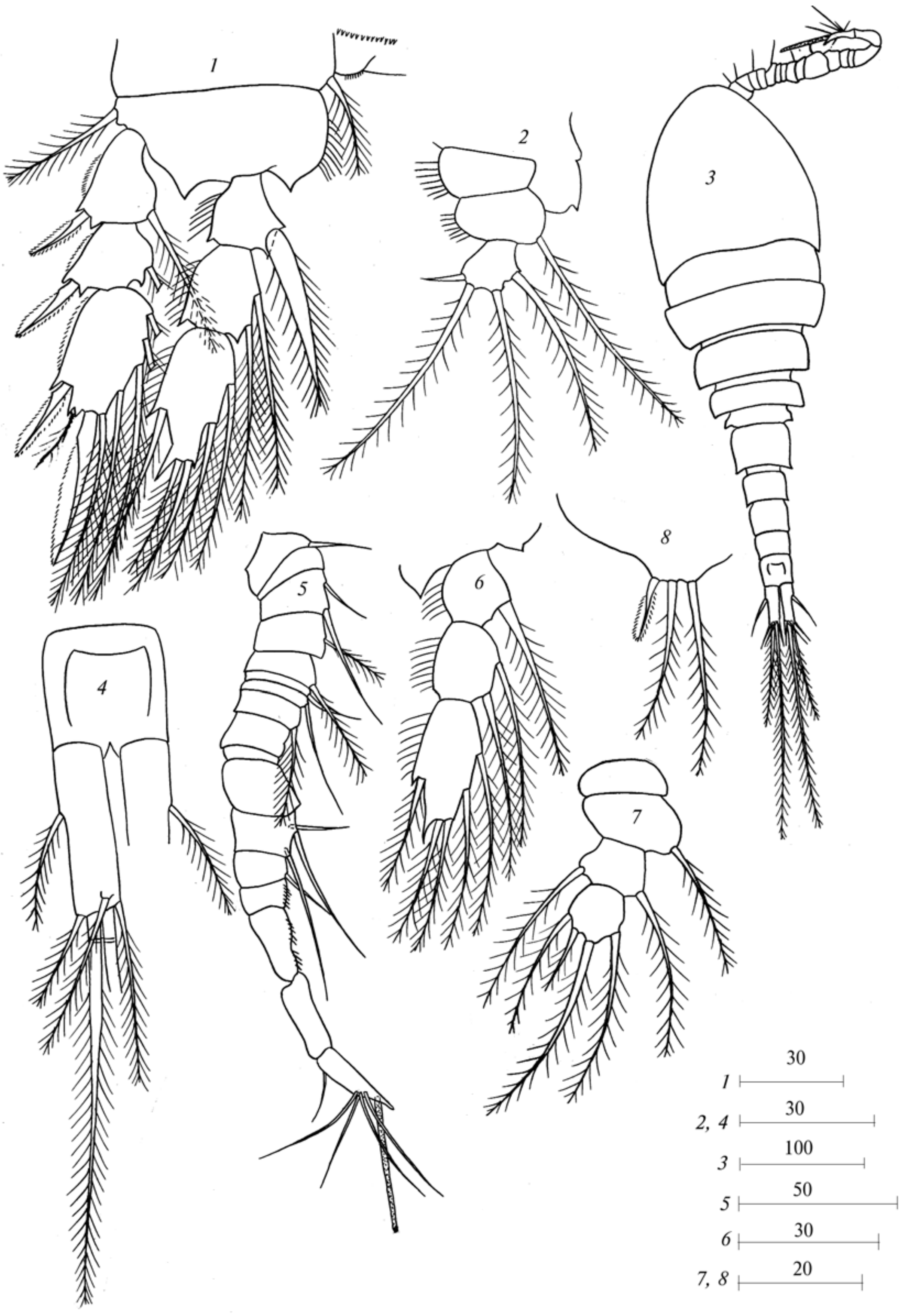


Fig. 3. *Cyclopinoides littoralis*, ♀: *1* — P4; *2* — P5. ♂: *3* — habitus, dorsal; *4* — caudal rami, dorsal view; *5* — geniculated antennula; *6* — endopodite of P4; *7, 8* — P5—P6.

Рис. 3. *Cyclopinoides littoralis*, ♀; *1* — P4; *2* — P5. ♂: *3* — общий вид, дорсально; *4* — каудальные ветви, дорсально; *5* — геникулирующая антеннула; *6* — эндоподит P4; *7, 8* — P5—P6.

P1—P4 4—4—4—2; spines extended, lanceolate; quantity of setae on these segments 4—5—5—5. First segments of all endopodites and the second segment of endopodite P1 bearing all on one seta, setae of first segments of P2—P4 are strong thickened (fig. 2, *5*; 3, *1*). Second segments of endopodites of P2—P4 with two setae. Third segments of P1—P3 each with 6 setae, P4—with 5 setae; two apical of them approximately equal to length of segment. This segment slender elongated, its length 1.8—1.9 times exceed the width. P5 (fig. 3, *2*) 3-segmented; first segment is deprived armament, the second with one outer seta and third – with four setae: of them innermost is the shortest.

Male. The total length 477 μm (fig. 3, *3*). Caudal rami shorter (index 3.2), than in female, with rather similar armament (fig. 3, *4*). Geniculated antennula 16-segmented (fig. 3, *5*). P5 4-segmented, with first segment without armament, second segment with one outer seta, third segment with two symmetrical setae and last segment armed with 4 plumose setae (fig. 3, *7*). P6 as on fig. 3, *8*.

One of the best former descriptions (Sars, 1913) did not include the description of oral appendages in detail shown above.

Distribution. The geographic range of this species has the disjunctive character. On the one hand, it inhabits coastal areas of the Arctic basin and boreal Atlantic, with the other two-three sites in Mediterranean Sea (Lindberg, 1953 etc.). In the Black Sea fauna before our researches it has been recorded only twice (Băcescu et al., 1957; Стахорская, 1970). The last author only mentioned it for one of estuaries near Odessa. We have found out this species in 10 sites at coast of the Black sea: twice in northwest part of the sea in Tendra gulf, in five sites of the Crimean coast, from village Mezhvodnoye up to Simeis and in three sites of the Caucasian coast: Anapa, Gelendjik bay, Batumi. Besides of the Black Sea the species for the first time is found out in the Sea of Azov: in Arabat gulf at villages near Semenovka and Mysovoye, in upper part of Utljuk gulf and in so called Sivash.

Ecology. In 8 of 14 cases of its records in the Black sea and the Sea of Azov we found this species in interstitial biotope (pebbly beach at Crimea, the Caucasian coast) or in a shell rock (Sea of Azov, in the Black Sea – Anapa, Gelendjik). Besides of this species is found by us on sea macrophytes of different species (*Zostera*, *Cystoseira*, etc.). According to other authors, the species meets in rather various biotopes. We did not meet it outside of polyhaline waters. It is remarkable, that in the Sea of Azov the species is found only in its southern most salty part, at salinity more than 15—20‰ (in upper part of Utlyuk gulf).

Băcescu M., Dumitresco H., Manca V. et al. Les sables a Corbulomya (Aloidis) maeotica Mill. – base trophique de premier ordre pour les poissons de la Mer Noire // Trav. Mus. d'histoire naturelle «Gr. Antipa». – 1957. – **1**. – P. 305–374.

Lindberg K. La sous-famille des Cyclopininae Kiefer (Crustacés, Copèpodes) // Ark. zool. – 1953. – **4**, N 16. – P. 311–325.

Sars G. O. An accout of the Crustacea of Norvay, Cyclopoida, 16. – Bergen, 1913. – 225 p.

Монченко В. І. Щелепнороті циклоподібні. Циклопи (Cyclopidae). – К. : Наук. думка, 1974. – 452 с. – (Фауна України; Т. 27, вип. 3).

Монченко В. И. Свободноживущие циклопообразные копеподы Понто-Каспийского бассейна. – Киев : Наук. думка, 2003. – 350 с.

Мордухай-Болтовской Ф. Д. Каспийская фауна в Азово-Черноморском бассейне. – М. ; Л. : Изд-во АН СССР, 1960 а. – 286 с.

Мордухай-Болтовской Ф. Д. Каталог фауны свободноживущих беспозвоночных Азовского моря // Зоол. журн. – 1960 б. – **39**, вып. 10. – С. 1434–1466.

Стахорская Н. И. Данные по биологии копепод в соленых лиманах и лагунах северо-западного Причерноморья // Вопр. рыбохоз. освоения и санитар.-биол. режима водоемов Украины. – Киев : Наук. думка, 1970. – Ч. 1. – С. 98–100.